

10. (New) A method of preventing corrosion and cracking in a molded plastic product comprising the step of applying an anticorrosive lubricant oil composition containing 100 parts by weight of a synthetic hydrocarbon oil having a kinematic viscosity of 10 to 500 mm²/s at 40°C and 0.1 to 10 parts by weight of a corrosion prevention additive to a surface of the molded plastic product.

REMARKS

The specification has been amended in order to correct grammatical and idiomatic errors contained therein. No new matter has been added.

In order to more particularly point out and distinctly claim the subject matter which Applicants regard as the claimed invention and respond to the formal and substantive rejections made by the Examiner in the outstanding Office Action, Claims 1-7 have been amended. Newly presented Claims 8 and 9 are directed to preferred embodiments of the present invention and Claim 10 is directed to a method of preventing corrosion and cracking in a molded plastic product utilizing the anticorrosive lubricant oil composition of the present invention. It is respectfully submitted that the currently claimed invention is patentably distinguishable over the prior art cited by the Examiner and contains no "new matter".

Claims 1-5 have been rejected under 35 USC 102(b) as being anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Matsuzaki et al or Pillon et al or JP 60031598. Claims 6 and 7 have been rejected under 35 USC 103(a) as being unpatentable over JP 60031598 or Boerwinkle et al. Applicant respectfully traverses these grounds of rejection and requests reconsideration in light of the following comments.

The presently claimed invention is directed to an anticorrosive lubricant oil composition containing 100 parts by weight of a synthetic hydrocarbon oil having a kinematic viscosity of 10-500 mm²/s at 40°C and 0.1 to 10 parts by weight of a corrosion prevention additive. The present invention also is directed to a method of preventing corrosion and cracking in a molded plastic product comprising the step of applying the above-described anticorrosive lubricant oil composition to a surface thereof. A third embodiment of the present invention is directed to a molded plastic product having the anticorrosive lubricant oil composition of the present invention applied to a surface thereof.

The present invention is based on the discovery that an anticorrosive lubricant oil composition containing 100 parts by weight of a synthetic hydrocarbon oil having a kinematic viscosity of 10 to 500 mm²/s at 40°C and 0.1 to 10 parts by weight of a corrosion prevention additive can unexpectedly prevent corrosion and cracking in a molded plastic product. As discussed in the present specification, conventional anticorrosive lubricant compositions containing ester or diester oils tend to chemically attack plastic products and cause damage and cracks thereto. It is respectfully submitted that the prior art cited by the Examiner does not disclose the presently claimed invention.

The Matsuzaki et al reference discloses a rust preventative composition which comprises a synthetic oil, an organophosphoric ester calcium salt, water and a rust inhibitor as essential ingredients. However, this reference has no specific disclosure of a poly α -olefin being contained therein or a synthetic hydrocarbon oil having the claimed kinematic viscosity. As discussed in the present specification, it has been found unexpectedly that the presently claimed lubricant oil composition can prevent

corrosion and cracking in molded plastic materials. This is clearly unexpected in light of the disclosure of Matsuzaki et al and patentably distinguishes the presently claimed invention thereover.

The Pillon et al reference discloses a lubricating oil having improved rust inhibition and demulsibility. A poly α -olefin having a viscosity of 30.4 centistokes at a temperature of 40°C and a viscosity index of 134 can be used as the base oil. A rust inhibitor also can be contained in the composition disclosed in Pillon et al. However, there is no disclosure in this reference regarding the composition being applied to a molded plastic product and the effects associated therewith. Therefore, it is respectfully submitted that the presently claimed invention is patentably distinguishable thereover.

JP 60031598 discloses a grease composition for lubricating ball joints which comprises a synthetic poly α -olefin oil, a wax and a urea compound adhesion improver. Although this reference discloses the use of this grease composition in the lubrication of a plastic ball seat, the presently claimed invention is distinguishable thereover as it is directed to an oil composition and not a grease composition. Greases do not have the same effect on plastics as oils and do not penetrate through the surface of the plastic so the grease cannot prevent cracking and swelling to molded plastic products as does the claimed oil composition. Moreover, the present invention does not include a wax or a urea compound. Therefore, it is respectfully submitted that the presently claimed invention clearly is patentably distinguishable thereover.

The Boerwinkle et al reference discloses plastic articles comprising a polyolefin polymer, an inorganic nitrate salt, a trisubstituted phenol and fumed silica. The volatile

corrosion preventative composition is a plastisol which is used at 250°F and decomposed. Therefore, although it may possess corrosion preventative properties, it does not necessarily provide lubrication properties. As such, it is respectfully submitted that the presently claimed invention clearly is distinguishable thereover.

In the present invention, the anticorrosive lubricant oil composition is coated on the molded plastic substrate at room temperature and can be used on gears and shafts of a duplicating machine or a facsimile machine. The coated anticorrosive lubricant oil composition does not volatilize from the surface of the plastic substrate during use and operates as a lubricant which fundamentally distinguishes the presently claimed invention from the Boerwinkle et al reference. As discussed above, JP 60031598 is directed to greases and has no suggestion with respect to treating the problem of cracking and swelling in molded plastic particles. Therefore, it is respectfully submitted that the presently claimed invention is patentably distinguishable over the combination of Boerwinkle et al and JP 60031598.

It is respectfully submitted that the presently claimed invention clearly is patentably distinguishable over the prior art cited by the Examiner. The Examiner is informed that the anticorrosive lubricant oil composition has achieved considerable success on a commercial basis. Therefore, Applicant respectfully requests that the Examiner reconsider the present application and pass it to issue.

Respectfully submitted,


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Encl: Marked-Up Amended Specification and Claims
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IN THE SPECIFICATION

Please amend the specification as follows.

Please replace paragraph [0001] with the following rewritten paragraph:

[0001] The present invention relates to an anticorrosive lubricant oil composition for molded plastic products, and molded plastic products with the same applied thereto. More specifically, the invention is concerned with an anticorrosive lubricating oil for molded plastic products, ~~causing new~~which prevents chemical attack ~~to occur~~from occurring to mechanical components such as gears, shafts, and so forth, formed of molded resins, even if used therefor, and with mechanical components such as gears, shafts, and so forth, to which the same is applied.

Please replace paragraph [0002] with the following rewritten paragraph:

[0002] Molded resins of polycarbonate resins, ABS resins, polystyrene resins, polycarbonate-ABS resins, and so forth have been in widespread use lately for mechanical components such as gears, shafts, and so forth of copying machines, facsimile machines, toys, and so on because of their mechanical strength, light weight, and low cost, by themselves or in combination with mechanical components made of metal.

Please replace paragraph [0005] with the following rewritten paragraph:

[0005] It is therefore an object of the invention to provide an anticorrosive lubricant oil composition for molded plastic products, causing no chemical attack to

the mechanical components such as gears, shafts, and so forth, made of plastic products, and to provide molded plastic products with the anticorrosive lubricant composition applied thereto.

Please replace paragraph [0006] with the following rewritten paragraph:

[0006] More specifically, the invention is intended to provide an anticorrosive lubricant oil composition exhibiting desirable effects, particularly, on molded resin products, made of resins selected from the group consisting of polycarbonate resins, ABS resins, polystyrene resins, and polycarbonate-ABS resins.

Please replace paragraph [0007] with the following rewritten paragraph:

[0007] The inventor has continued intensive studies for solving the problem described above, and has discovered the fact that a composition, containing a synthetic hydrocarbon oil having a kinematic viscosity of 10 to 500 mm²/s at 40°C, particularly, a poly α -olefin as a major constituent, and combined with an anticorrosive, does not cause any chemical attack to molded plastic products, and has succeeded in developing the invention. In particular, a sulfonate based anticorrosive is desirable as the anticorrosive used in carrying out the invention.

Please replace paragraph [0009] with the following rewritten paragraph:

[0009] As a synthetic hydrocarbon oil having a kinematic viscosity of 10 to 500 mm²/s at 40°C, used in carrying out the invention, there are available

polybutene and poly α -olefins. In particular, poly α -olefins can be suitably used.

Please replace paragraph [0010] with the following rewritten paragraph:

[0010] With a kinematic viscosity ~~at~~of not more than 10 mm²/s at 40°C, there will be no effect of preventing chemical attack while with a kinematic viscosity ~~at~~of not less than 500 mm²/s at 40°C, workability will deteriorate.

Please replace paragraph [0022] with the following rewritten paragraph:

[0022] (1) an anticorrosive lubricant composition for molded plastic products, containing 100 parts by weight of a synthetic hydrocarbon oil having a kinematic viscosity of 10 to 500 mm²/s at 40°C, and 0.1 to 10 parts by weight of a corrosion prevention additive;

Please replace paragraph [0023] with the following rewritten paragraph:

[0023] (2) the anticorrosive lubricant composition for molded plastic products, as set forth under (1) above, wherein the synthetic hydrocarbon oil is a poly α -olefin;

Please replace paragraph [0031] with the following rewritten paragraph:

[0031] For a poly α -olefin, use was made of a PAO, with which various sulfonate based anticorrosives were mixed in a vessel in the proportions shown in Table 1, and mixtures thus obtained were homogenized, thereby obtaining anticorrosive lubricant compositions.

Please replace the paragraph beginning on page 14, line 11, and ending on page 14, line 18, with the following rewritten paragraph:

Thus, it has been confirmed that as is evident from Tables 1 and 2, the testpieces made of plastics, treated with the respective anticorrosive lubricant compositions for molded plastic products, according to the invention, are capable of checking the occurrence of cracks to a large extent in comparison with the testpieces made of plastics, treated with the conventional anticorrosive lubricant compositions for molded plastic products.

IN THE CLAIMS

Please amend Claims 1-6 as follows.

1. (Amended) An anticorrosive lubricant oil composition for molded plastic products, containing 100 parts by weight of a synthetic hydrocarbon oil having a kinematic viscosity of 10 to 500 mm²/s at 40°C, and 0.1 to 10 parts by weight of a corrosion prevention additive.

2. (Amended) An anticorrosive lubricant oil composition for molded plastic products according to eClaim 1, wherein said synthetic hydrocarbon oil is a poly α -olefin.

3. (Twice Amended) An anticorrosive lubricant oil composition for molded plastic products according to eClaim 1, wherein said poly α -olefin is ~~a mixture of at least one kind or not less than two kinds, member~~ selected from the group consisting of oligomers of decene-1 ~~such as a dimer, trimer, tetramer, and so forth, of decene-1.~~

4. (Twice Amended) An anticorrosive lubricant oil composition for molded plastic products according to eClaim 1, wherein said corrosion prevention additive is a sulfonate based anticorrosive.

5. (Twice Amended) An anticorrosive lubricant oil composition for molded plastic products according to eClaim ~~4~~4, wherein said sulfonate based anticorrosive is at least one kind or not less than two kinds, member selected from the group consisting of Li-sulfonate, Ba-sulfonate, Ca-sulfonate, and Zn-sulfonate.

6. (Twice Amended) Molded plastic products to which said anticorrosive lubricant oil composition for molded plastic products according to eClaim 1 is applied, and which is composed of at least one kind of resin, or not less than two kinds of resins, selected from the group consisting of polycarbonate resins, ABS resins, polystyrene resins, and polycarbonate-ABS resins.